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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,540	01/15/2004	Dong-kee Sohn	249/441	3055

7590 01/30/2006
LEE & STERBA, P.C.
Suite 2000
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EXAMINER

DO, AN H

ART UNIT	PAPER NUMBER
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2853

DATE MAILED: 01/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

✓ # 312

Office Action Summary	Application No.	Applicant(s)	
	10/757,540	SOHN ET AL.	
	Examiner	Art Unit	
	An H. Do	2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 January 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>See 1449s</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statements (IDS) submitted on 21 June 2004, 11 July 2004 and 03 March 2005 was filed and are being considered by the examiner.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-10 and 13-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Nemoto et al (US 5,713,673).

Nemoto et al disclose in Figures 19 and 20 the following claimed features:

Regarding claim 1, an ink-jet printhead (Figure 19), comprising: an ink chamber (22) to be filled with ink and an ink channel (15) to supply the ink chamber with ink, the ink chamber (22) and the ink channel (15) formed in a passageway plate (14); a cover plate (29) provided on the passageway plate (14); an ink ejection hole (nozzle 23) formed through the cover plate (29) at a position corresponding to the ink chamber (22); a condenser lens (Figure 20, lens 19) provided on a bottom surface of the passageway plate at a position corresponding to the ink chamber (22); and laser beam irradiating

means (18) for irradiating a laser beam (L) through the condenser lens (19) and onto ink contained in the ink chamber (Figure 20), wherein a surface of the ink is vibrated by a pressurized wave generated by the laser beam, and a vibration (32) causes an ink droplet to be expelled through the ink ejection hole from the surface of the ink.

Regarding claim 2, wherein the passageway plate (14) is formed of a silicon substrate that is transparent with respect to an infrared ray (column 2, lines 16-17).

Regarding claim 3, wherein the laser beam irradiating means is an infrared laser (column 2, line 13).

Regarding claim 4, wherein the passageway plate (14) is formed of a glass substrate (since passageway plate is transparent, it's inherent to have it made from glass).

Regarding claim 5, wherein the condenser lens is integrally formed with the passageway plate (Figure 19 when everything is assembled).

Regarding claim 6, further comprising: a lens plate (plate having a plurality of lenses 19) provided on the bottom surface of the passageway plate, the lens plate including the condenser lens (19).

Regarding claim 7, wherein the laser beam irradiating means (18) is a semiconductor laser (column 3, line 6).

Regarding claim 8, wherein the condenser lens (19) is convex shaped (Figure 20).

Regarding claim 9, wherein the ink chamber (22) is a plurality of ink chambers (22Y, 22M, 22C) positioned at predetermined intervals in the passageway plate (14),

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the ink ejection hole is a plurality of ink ejection holes (23), each formed at a location corresponding to one of the plurality of ink chambers (22), and the condenser lens (19) is a plurality of condenser lenses (19), each formed at a location corresponding to one of the plurality of ink chambers (Figure 19).

Regarding claim 10, wherein the laser beam irradiating means (18) comprises: a semiconductor laser (column 3, line 6); and a light path controller (control IC 34) for controlling a path of a laser beam emitted from the semiconductor laser (Figure 19).

Regarding claim 13, wherein the ink ejection hole (23) has a shape selected from the group consisting of circular, oval and polygonal (Figure 19).

Regarding claim 14, wherein the ink ejection hole (23) is sufficiently large to prevent contact between the ink droplet being expelled and the cover plate (Figure 19).

Regarding claim 15, a method of expelling ink, comprising: filling an ink chamber (22) with ink; irradiating (18) a laser beam (L) onto the ink contained in the ink chamber (22) to generate a pressurized wave in the ink and vibrating a surface of the ink using the pressurized wave (Figure 20); and expelling an ink droplet (Figure 20, elements 32Y, 32M, 32C) from the surface of the ink by the vibration of the surface of the ink.

Regarding claim 16, further comprising: converging the laser beam (L) using a condenser lens (19) before irradiating the laser beam (L) onto the ink.

Regarding claim 17, wherein the laser beam (L) has a sufficiently high energy and is irradiated onto the ink for a sufficiently short period of time to prevent boiling the ink (Figure 20).

Regarding claim 18, wherein the ink chamber (22) is a plurality of ink chambers (22Y, 22M, 22C) and irradiating (18) the laser beam (L) onto the ink comprises: selectively irradiating(18) the laser beam (L) onto ink contained in one or more of the plurality of ink chambers (Figure 20).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nemoto et al (US 5,713,673) in view of Yi et al (US 6,582,058).

Nemoto et al disclose the claimed invention except for reciting the cover plate is a silicon substrate and has a hydrophobic surface.

Yi et al teach that the nozzle plate is a silicon substrate and has a hydrophobic surface (column 3, lines 30-33).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the cover plate made of a silicon substrate and has a hydrophobic surface, as taught by Yi et al into Nemoto et al, for the purpose of preventing the nozzle clogging (column 3, lines 34-36).


Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to An H. Do whose telephone number is 571-272-2143. The examiner can normally be reached on Monday-Friday (Flexible).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on 571-272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AD
January 26, 2006



An H. Do
Examiner
Art Unit 2853